

PROPOSED

Review of Permit Renewal Application No. 0481-03 Temporary Covered Source Permit (CSP) No. 0481-01-CT

Applicant: Bolton, Inc.

Facility: 475 TPH Portable Stone Processing Plant

SIC Code: 1442 (construction sand and gravel)

Location: Various sites, State of Hawaii

Initial Location: Natural Energy Laboratory of Hawaii Authority
TMK 7-3-9:23
Kailua-Kona, Island of Hawaii

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I. Background

Bolton, Inc. operates an existing portable stone processing plant in Kailua-Kona. Since being issued an initial temporary covered source permit on 11/6/00, the facility has requested 18 location changes within the west side of the island of Hawaii. Its current project involves removing and crushing stone on relatively flat terrain near the intersection of Queen Kaahumanu Highway and the access road to the Natural Energy Laboratory of Hawaii Authority in Kailua-Kona.

The facility seeks to increase operating hours of its 330 HP diesel engine (DE) and 480 HP diesel engine generator (DEG). Submittals from the facility to the Department of Health (DOH) are listed in the following table.

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Table 1: Applicant Submittals	
Submittal Date	Description
6/13/01	Application for Significant Modification: Increase operating hours for the 330 DE and 480 DEG from 2,080 to 4,000 hours per rolling 12-month period.
4/19/02	Addendum 1: Increase stack height of the 330 HP DEG to 6 meters. Increase operating hours for the 330 DE and 480 DEG from 2,080 to 3,400 hours per rolling 12-month period.
5/27/03	Addendum 2: Revise modeling analysis to address DOH concerns.
2/9/04	Addendum 3: Address other DOH concerns regarding the modeling analysis.
10/27/04	Permit Renewal Application: Increase operating hours for the 330 DE and 480 DEG from 2,080 to 3,000 hours per rolling 12-month period.

Current permit proposals:

- Increase the 330 HP DE and 480 HP DEG stack heights to 7 meters (23 feet).
- Limit operating hours of the 330 HP DE and 480 HP DEG to a maximum of 3,000 hours each per rolling 12-month period.

Description of Facility Process and Operation:

Basalt rock is the main material processed. A front end loader loads the material into the grizzly feeder of the primary jaw crusher. The crushed material travels on two conveyor belts to the screening decks of the impact crusher. Oversize material is fed to the impact crusher then returned to the screening decks on two conveyor belts. Material passing through the screening decks is transferred to a stockpile via a stacking conveyor.

Per Section C of the 10/27/04 permit renewal application, the facility is generally operated 8 hours per day, 5 days per week, (or approximately 2,080 hours per year) .

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II. Equipment Description

Table 2: Equipment					
Unit	Manufacturer	Model No.	Serial No.	Maximum Capacity	Manuf. Date
Primary jaw crusher with grizzly feeder	Aggregate Machinery, Inc.	Thunderbird II, 3350JVDH-D-3396	Plant: 2022-00 Jaw: 402363	475 TPH	2000
Horizontal impact crusher with 2-deck screen	Aggregate Machinery, Inc.	Thunderbird II, 13156163IC-D2860	10094	225 TPH	2000
Radial stacker	Aggregate Machinery, Inc.	Thunderbird II, 4280PRS30	2025-00	N/A	2000
Diesel engine	Cummins	M11-P	35006865	330 HP at 2100 rpm, 15.9 gph	2000
Diesel engine generator	Cummins engine	NTA855-G3	33071	480 HP at 1800 rpm, 22.9 gph	2000
	Onan generator	DFCC 4482307	E000108406		

III. Air Pollution Controls

Sulfur dioxide emissions are controlled using fuel containing no more than 0.5% sulfur by weight.

A water spray system is operated and maintained to control fugitive dust emissions. Per Section B1 of the 10/27/04 application, location of water sprays include the following:

- Transfer point from grizzly feeder to jaw crusher
- Transfer point from jaw crusher to conveyor 1
- Transfer point from conveyor 1 to conveyor 2
- Above conveyor 2
- Transfer point from screening decks to impact crusher
- Transfer point from impact crusher to conveyor 3
- Transfer point from conveyor 3 to conveyor 2
- Transfer point from conveyor 4 to transfer conveyor
- Transfer point from transfer conveyor to stacking conveyor
- Transfer point from stacking conveyor to stockpiles

Water is obtained from public or private water lines and portable water tanks. When a portable water tank is used, water is pumped using an electric water pump with approximate pumping capacity of 900 gallons per hour. The pump is powered by a 3.5 HP gas generator which is considered an insignificant activity. A water truck is used to control fugitive dust from stockpiles, crushing areas and truck access routes.

IV. Applicable Requirements

1. Hawaii Administrative Rules (HAR), Title 11

Chapter 59, Ambient Air Quality Standards

Chapter 60.1, Air Pollution Control

Subchapter 1 - General Requirements

Subchapter 2 - General Prohibitions

11-60.1-31 Applicability

11-60.1-32 Visible emissions

11-60.1-33 Fugitive dust

11-60.1-38 Sulfur Oxides from Fuel Combustion

Subchapter 5 - Covered Sources

Subchapter 6 - Fees for Covered Sources, Noncovered Sources, and Agricultural Burning

11-60.1-111 Definitions

11-60.1-112 General Fee Provisions for Covered Sources

11-60.1-113 Application Fees for Covered Sources

11-60.1-114 Annual Fees for Covered Sources

11-60.1-115 Basis of Annual Fees for Covered Sources

Subchapter 8 - Standards of Performance for Stationary Sources

11-60.1-161 New Source Performance Standards

Subchapter 10 - Field Citations

2. PSD Requirements

PSD requirements do not apply because the facility is not considered a major stationary source and is not proposing any modifications to trigger a major modification as defined in 40 CFR 52.21 and HAR Title 11, Chapter 60.1, Subchapter 7.

3. NSPS Requirements

40 Code of Federal Regulations, Part 60, Standards of Performance for New Stationary Sources (NSPS)

Subpart A - General Provisions

Subpart OOO - Standards of Performance for Non-Metallic Mineral Processing Plants

Subpart OOO applies to portable crushed stone plants with capacities greater than 150 TPH which commence construction, reconstruction, or modification after August 31, 1983. Since this facility meets the size and date criteria, it is subject to Subpart OOO.

4. NESHAP Requirements

These requirements do not apply because no standard covering the facility's operation or equipment has been promulgated under 40 CFR 61.

5. MACT Requirements

These requirements do not apply because the facility is not a major source of hazardous air pollutants and the facility does not belong to a source category or subcategory for which a standard has been promulgated under 40 CFR 63.

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6. BACT Requirements

A BACT review is required for new or modified sources which will result in a “significant” net emissions increase as defined in HAR §11-60.1-1. Since proposed modifications will not result in a significant net emissions increase, a BACT review is not required.

7. CAM Requirements (40 CFR 64)

The purpose of Compliance Assurance Monitoring (CAM) is to provide reasonable assurance that compliance is being achieved with large emission units that rely on air pollution control devices to meet an emissions limit or standard. CAM applies if the emissions unit:

1. is located at a major source;
2. is subject to an emissions limit or standard;
3. uses a control device to achieve compliance;
4. has potential pre-control emissions that are 100% of the major source level; AND
5. is not otherwise exempt from CAM.

Since the facility is not a major source, CAM does not apply.

8. CER Requirements

Consolidated Emissions Reporting (CER) requirements apply if facility emissions equal or exceed levels specified in 40 CFR 51, Subpart A, Appendix A, shown in the following table. CER requirements do not apply because facility emissions do not equal or exceed the CER threshold levels. However annual emissions reporting is requested of all covered sources.

9. Major Source Applicability

This facility is not a major source based on potential emissions, considering controls and operational limits, that are below major source levels.

10. Synthetic Minor Source Applicability

Table 3: Emissions and Triggering Levels					
	Potential	Actual Emissions	Net	Significant	CER Reporting
	Emissions	2002 & 2003 Avg.	Emissions	Level	Level
Pollutant	(tpy)	(tpy)	Increase (tpy)	(tpy)	(tpy)
CO	5.81	0.80	5.0	100	1000
NOx	20.73	4.90	15.8	40	100
PM	36.72	16.50	20.2	25	N/A
PM10	12.49	5.30	7.2	15	100
SO2	4.10	1.00	3.1	40	100
TOC/VOC	1.43	0.10	1.3	40	100
Pb	-	-	0.0	0.6	5

A synthetic minor is a facility that is potentially major (as defined in HAR §11-60.1-1) but is made non-major through federally enforceable permit conditions. This facility is a synthetic minor based on potential PM emissions that are greater than major source levels when the facility is operated at its maximum capacity continuously for 8,760 hr/yr.

V. Insignificant Activities

Table 4: Insignificant Activities	
Description	HAR Reference
1 - 250 gallon diesel fuel storage tank 1 - 600 gallon diesel fuel	11-60.1-82(f)(1) Any storage tank, reservoir, or other container of capacity equal to or less than 40,000 gallons storing volatile organic compounds, except those storage tanks, reservoirs, or other containers subject to any standard or other requirement pursuant to Sections 111 and 112 of the Act.
1 - 3.5 HP gas engine generator to run the water pump as needed	11-60.1-82(g)(8) Gasoline fired portable industrial equipment less than 25 horsepower in size .

VI. Alternative Operating Scenarios

If the 330 DE and/or 480 HP DEG are inoperable, a unit of the same or smaller size will be used as a temporary replacement until the original DE or DEG is repaired and again operable.

VII. Project Emissions

Potential emission sources from the facility include the DE and DEG point sources and fugitive emissions from crushing, travel on unpaved roads and aggregate handling. Calculations are contained in the appendix and results are shown in the following table.

Table 5: Facility Emissions with Operating Limits (TPY)							
Pollutant	330 HP DE	480 HP DEG	3.5 HP GEG	Crushing Operations	Unpaved Roads	Aggregate Handling	Total
CO	1.13	2.38	2.3				5.81
NO _x	7.10	13.57	0.06				20.73
PM	0.13	0.21		13.18	21.55	1.65	36.72
PM-10	0.13	0.21		5.01	6.36	0.78	12.49
PM-2.5	0.13	0.21		2.70	0.98	0.25	4.27
SO ₂	1.68	2.42					4.10
TOC	0.23	0.40	0.8				1.43
Pb	-	-					-
HAPs	0.02	0.03					0.05

VIII. Air Quality Assessment

An Ambient Air Quality Impact Assessment (AAQIA) is generally performed for new or modified sources. Since the applicant proposes to increase the DE and DEG operating hours from 2,080 to 3,000 per rolling 12-month period, an AAQIA using the Screen3 model was performed on the two point sources. The following assumptions were used:

- 330 HP DE and 480 HP DEG operated a maximum of 3,000 hours per year.
- Rural area.
- Terrain with 7% slope.
- Default meteorology.
- Ambient temperature of 298 K (76 F).
- 1 g/sec of pollutant.
- Critical building for potential downwash for both emission sources is the impact crusher with the following dimensions:

Table 6: Impact Crusher Dimensions			
Units	Height	Length	Width
Meters	4.42	9.75	2.40
Feet	15	32	7' - 10-1/2"

- Stack parameters and emission rates as shown.

Table 7: Stack Parameters & Emission Rates		
	330 HP DE	480 HP DEG
Stack Height (meters)	7	7
Stack Diameter (inches)	4	5
Exhaust Flow (cfm)	1950	2785
Exhaust Velocity (fps)	373	340
Exhaust Temperature (F)	820	970
CO (g/sec)	0.095	0.2
NOx (g/sec)	0.597	1.14
PM-10 (g/sec)	0.011	0.017
SO ₂ (g/sec)	0.141	0.203

- Background concentrations based on HELCO data in Kona for the year 2000.

Results shown in the following tables indicate that predicted ambient concentrations will meet National Ambient Air Quality Standards (NAAQS) and State Ambient Air Quality Standards (SAAQS).

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Table 8: Predicted Pollutant Concentrations								
Pollutant	Avg. Time	Max 1-hr Conc. (ug/m3)	Emis- sions (g/sec)	Time Factor	Pred. Conc. (ug/m3)	Adjust for Annual Limit (3000 hr/yr)	Tier 2 NOx Adjustment	Adjusted Conc. (ug/m3)
330 HP DE								
CO	1 hr	783	0.095	1	74.4			74.4
CO	8 hr	783	0.095	0.7	52.1			52.1
NO2	annual	783	0.597	0.2	93.5	32.0	24.0	24.0
PM-10	24 hr	783	0.011	0.4	3.4			3.4
PM-10	annual	783	0.011	0.2	1.7	0.6		0.6
SO2	3 hr	783	0.141	0.9	99.4			99.4
SO2	24 hr	783	0.141	0.4	44.2			44.2
SO2	annual	783	0.141	0.2	22.1	7.6		7.6
480 HP DEG								
CO	1 hr	701	0.200	1	140.2			140.2
CO	8 hr	701	0.200	0.7	98.1			98.1
NO2	annual	701	1.140	0.2	159.8	54.7	41.0	41.0
PM-10	24 hr	701	0.017	0.4	4.8			4.8
PM-10	annual	701	0.017	0.2	2.4	0.8		0.8
SO2	3 hr	701	0.203	0.9	128.1			128.1
SO2	24 hr	701	0.203	0.4	56.9			56.9
SO2	annual	701	0.203	0.2	28.5	9.8		9.8
Note: The maximum concentration was predicted to occur 50 meters away from each of the two sources.								

Table 9: Comparison with SAAQS & NAAQS									
Pollutant	Avg. Time	330 HP DE Conc. (ug/m3)	480 HP DEG Conc. (ug/m3)	Total Conc. (ug/m3)	Bkgrd. Conc. (ug/m3)	Total Impact (ug/m3)	SAAQS	NAAQS	% SAAQS/ NAAQS
CO	1 hr	74.4	140.2	214.6	969	1184	10000	40000	12
CO	8 hr	52.1	98.1	150.2	736	886	5000	10000	18
NO2	annual	24.0	41.0	65.0	2	67	70	100	96
PM-10	24 hr	3.4	4.8	8.2	27	35	150	150	23
PM-10	annual	0.6	0.8	1.4	12	13	50	50	27
SO2	3 hr	99.4	128.1	227.5	87	315	1300	-	24
SO2	24 hr	44.2	56.9	101.1	34	135	365	365	37
SO2	annual	7.6	9.8	17.4	4	21	80	80	27

IX. Significant Permit Conditions

- The 475 TPH Portable Stone Processing Plant is subject to requirements of NSPS Subparts A and OOO.

Purpose: This federal standard applies to portable crushed stone plants with capacities greater than 150 TPH which commence construction, reconstruction, or modification after August 31, 1983.

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2. Operating hours for both the 330 HP DE and 480 HP DEG shall not exceed 3,000 hours each for any rolling 12-month period.

Purpose: Emission calculations are based on this limit proposed by the applicant.

3. Power for the primary crusher and grizzly feeder shall only be provided by the 330 DE.

Purpose: If the power source for the primary crusher and feeder is limited to the 330 HP DE, and operating hours for the DE are limited to 3,000 hours per rolling 12-month period, then calculating emissions for the primary crusher and feeder based on 3,000 hours per year is valid.

4. Power for the impact crusher and screen shall only be provided by the 480 HP DEG,

Purpose: If the power source for the impact crusher and screen is limited to the 480 HP DEG, and operating hours for the DEG are limited to 3,000 hours per rolling 12-month period, then calculating emissions for the impact crusher and screen based on 3,000 hours per year is valid.

5. The minimum stack heights for the 300 HP DE and the 480 HP DEG shall be 7 meters (23 feet) above ground

Purpose: The ambient air quality assessment is based on this increased stack height indicated in the renewal application.

6. The 330 HP DE and the 480 HP DEG shall only be fired on diesel no. 2 with a maximum sulfur content of 0.5% by weight.

Purpose: Per HAR §11-60.1-38(a), no person shall burn any fuel containing an excess of 2% by weight, except for fuel used in ocean-going vessels. Emission calculations are based on the use of diesel no. 2 with a maximum sulfur content of 0.5% by weight.

5. Reasonable efforts shall be taken to control fugitive emissions from the stone processing plant. This includes the use of water sprays at all crushers, transfer points, loading operations, unpaved roads, and aggregate stockpiles. It also includes maintenance of water sprays in good operating condition.

Purpose: Control PM and PM-10 emissions.

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X. Conclusion

In its renewal application, Bolton, Inc. proposes to increase operating hours from 2,080 to 3,000 hours per rolling 12-month period. Facility emissions may be less than calculated in this review based on the following:

- Although the applicant has proposed an operating limit of 3,000 hours per year for the 330 HP DE and 480 HP DEG, plant operation is typically 2,080 hours per year, per Section C of the 10/27/04 renewal application.
- Although sulfur dioxide emissions were calculated based on a 0.5% sulfur content, the sulfur content of the fuel supplied to the facility is typically 0.2%, per Section D1 of the 10/27/04 renewal application.

Renewal of CSP 0481-01-CT incorporating a significant modification is recommended based on the review of the information provided by the applicant, subject to the significant permit conditions and to EPA review.

April Matsumura
April 29, 2005